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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,003	01/16/2002	Sooyoul Hong	155634-0130	9134

1622 7590 07/02/2003
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EXAMINER

RICKMAN, HOLLY C

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/052,003

Applicant(s)

HONG ET AL.

Examiner

Holly Rickman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Do et al. (US 6372330).

Do et al. disclose a magnetic recording medium having a non-magnetic substrate, an underlayer, a first magnetic layer, a non-magnetic spacer layer, a second magnetic layer, and another spacer layer thereon. Additional antiferromagnetically coupled magnetic layers are deposited thereon and an overcoat is deposited on top of these layers (see Fig. 6). The reference teaches that the non-magnetic spacer layers can be formed from any one of Ru, Cr, Rh, Ir, and Cu (col. 3, lines 57-66). An example is described wherein both spacer layers are formed from Ru (col. 8, lines 18-36). The reference fails to explicitly disclose an embodiment having a first non-magnetic spacer formed from Ru and a second spacer formed from Cr.

It would have been obvious to one of ordinary skill in the art to substitute a Cr spacer layer for the spacer layer 36' shown in Fig. 6 in view of the reference's teaching of the functional equivalence of Ru and Cr.

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3. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Do et al. (US 6372330) in view of Shimizu et al. (US 2002/0127433).

Do et al. teach all of the limitations of the claims, as detailed above, except for the presence of a lubrication layer on top of the protective overcoat.

Shimizu et al. teaches a magnetic recording medium having an antiferromagnetically coupled structure with an overcoat layer and a lubricant layer thereon. The reference teaches that the lubricant layer provides lubrication between the disk surface and the magnetic head (paragraphs [0045], [0076]-[0077]).

It would have been obvious to one of ordinary skill in the art at the time of invention to add a lubrication layer on top of the overcoat taught by Do et al. in order to enhance lubrication between the recording medium surface and the magnetic head.

4. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Do et al. (US 6372330) in view of Bian et al. (US 6572989).

Do et al. disclose a magnetic recording medium having a non-magnetic substrate, an underlayer, a first magnetic layer, a non-magnetic spacer layer, a second magnetic layer, and another spacer layer thereon. Additional antiferromagnetically coupled magnetic layers are deposited thereon and an overcoat is deposited on top of these layers (see Fig. 6). The reference teaches that the non-magnetic spacer layers can be formed from any one of Ru, Cr, Rh, Ir, and Cu (col. 3, lines 57-66). An example is described wherein both spacer layers are formed from Ru (col. 8, lines 18-36). The reference fails to explicitly disclose an embodiment having a first non-magnetic spacer formed from Ru and a second spacer formed from Cr.

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It would have been obvious to one of ordinary skill in the art to substitute a Cr spacer layer for the spacer layer 36' shown in Fig. 6 in view of the reference's teaching of the functional equivalence of Ru and Cr.

The reference is also silent with respect to the specific elements of the magnetic recording apparatus for use therewith.

Bian et al. teaches a conventional disk drive structure which includes a recording medium, a plurality of actuator arms, a spindle and spindle motor, magnetic head, and a voice control motor (col. 5, lines 24-62).

It would have been obvious to one of ordinary skill in the art at the time of invention to use a conventional recording head assembly such as the one taught by Bian et al. in combination with the recording medium taught by Do et al. in order to form a functional disk drive.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Do et al. (US 6372330) in view of Bian et al. (US 6572989) and further in view of Shimizu et al. (US 2002/0127433).

Do et al. in view of Bian et al. teach all of the limitations of the claim, as detailed above, except for the presence of a lubrication layer on top of the protective overcoat.

Shimizu et al. teaches a magnetic recording medium having an antiferromagnetically coupled structure with an overcoat layer and a lubricant layer thereon. The reference teaches that the lubricant layer provides lubrication between the disk surface and the magnetic head (paragraphs [0045], [0076]-[0077]).

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It would have been obvious to one of ordinary skill in the art at the time of invention to add a lubrication layer on top of the overcoat taught by Do et al. in order to enhance lubrication between the recording medium surface and the magnetic head.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (703) 305-2642. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul J. Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Holly Rickman
Primary Examiner
Art Unit 1773

hcr
June 30, 2003